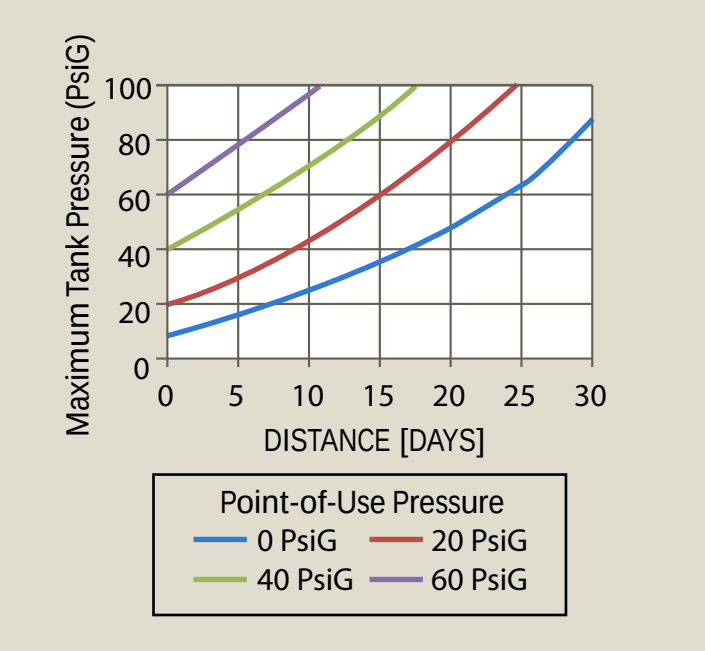
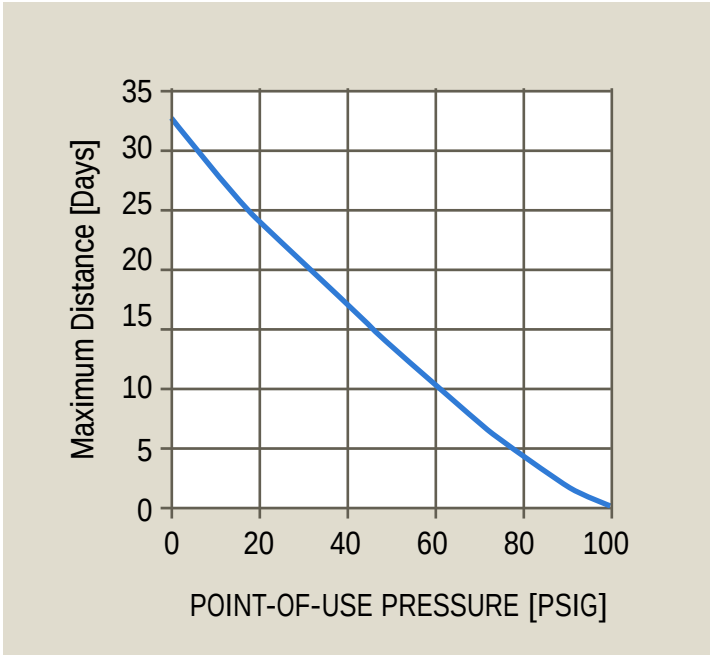


F. .ure 2: Ma . .u a re .ure a a .u c. e- a ra e d a ce a d . - -u e re .ure



F. .ure 3: Ma . .u .u ber da . e eac a a a .u c. e . - -u e re .ure

- Tank: Chart ICC-115-P-100
  - Capacity: 11,495 gal
  - MAWP: 100 psig
  - Evaporation rate: 0.20% per day
- LNG Source: Atmospheric Tank
  - Pressure: 1.25 psig
  - State: Saturated liquid
  - 96% Methane
  - 2% Ethane
  - 0.6% Nitrogen
  - Remainder C3+
- Point-of-use
  - Pressure: Varied
  - State: Vapor
- Loading & Unloading Parameters
  - Heel: 800 gal
  - Ullage: 550 gal
  - Travel time: Varied

In the above assumptions, two parameters are left as variables. The most impactful is the travel time from Jamaica to Florida. While the model allows the time to Jamaica to differ from the time returning from Jamaica, we assume these are equal to simplify calculations. The other important parameter is the pressure at which the point-of-use is using its gasiþed LNG. If this value is very high then the ISO tank is able to release less of the pressure it built up on the journey to Jamaica to the point-of-use. This provides less pressure budget for the return trip, reducing maximum travel time.

Results

We constructed a process model in the program VMGSim that allows for the simulation of each step of the process. Using the assumptions stated above, the model has been converged while case studies on the variable quantities are conducted. These studies generate the data shown in Figure 2. This þgure provides the relationship between maximum pressure across the journey, the length of the journey, and the point-of-use pressure. One can see that increasing either the point-of-use pressure or the one-way journey duration increases the maximum pressure. In most cases, the tank

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achieved maximum pressure after it had been emptied then heated from its return trip to Florida. Only in the case of very short duration, low point-of-use pressure, does the maximum pressure occur elsewhere. With minor modiþcations to the model, we are able to þnd the maximum number of days the container can be in transit before the tank pressure reaches 100 psig. The results of this formulation are provided in Figure 3.

The procedures of point-of-use unloading ensure that the ISO tank pressure and the point-of-use pressure are always equilibrated. If the tank arrives at a lower pressure (colder) than the point-of-use pressure, then a pressure building coil is activated to increase the pressure to the set point. Another case is when a high pressure (warmer) tank arrives, wherein the vapor is used until the set pressure has been reached. After this initial pressurized vapor is removed and the pressure reduced, the coil will maintain the pressure as more LNG is removed as a vapor.

The pressure of the ISO tank after it has been þlled from the LNG source is not a þxed variable, unlike the point- int-

Figure 4: Data re.ure er ec.ur e a.ur e 20-da - - d a ce a d a - -u e re.ure 20